smoking), senses (length of vision, endurance, hearing, smell taste), sleep (hours, profundity, dreaming), muscular activity (walking, manly sports, handedness, voice, health, maladies, infirmities, deformities), hereditary resemblances (to which progenitor or ancestor most marked ?).

3. *Psychic characters.*—Disposition (sad or gay, calm or violent, constant or changeable, energetic or irresolute, penchants, religious habit, literary taste, aptitude, music design, mathematics, poetry, elocution), memory (strength, peculiarities, intellectual endurance, manner of doing intellectual work, daily occupations), hereditary resemblances (to what relative degree of transmission).

4a. *Heredity Descendant.*—Name of wife, age, birthplace, date of marriage, death, peculiar maladies, fatal malady, color of eyes and hair, height, temperament, physical and psychical aptitudes, number of children, and for each the age, sex, color of eyes and hair, date of death, chief diseases, fatal disease, character and temperament, memory, mental aptitudes, character, like which parent or ancestor or relative, and in what particulars.

4b. *Heredity Ascendant.*—Father, mother, grandparents and great grandparents, uncles, aunts, great uncles and great aunts.

4c. *Heredity collateral.*—Brothers and sisters, date and place of birth, height, color of eyes and hair, profession, temperament, physical and psychical aptitudes, intelligence, principal maladies, fatal malady. For each characteristic determine whether there is any physical or psychical resemblance to any ancestor or relative.

It seems to the editor of these notes that nothing is more desirable at this time than a laborious effort to place comparative human physiology and psychology on a firm basis. A scheme like the one presented by the Paris Anthropological Society, if vigorously pushed will soon show its own defects. One serious difficulty will be to get persons to answer the questions, some of which may be deemed impertinent.

MICROSCOPY AND HISTOLOGY.[1]

MR. IIJIMA'S METHODS OF PREPARING PLANARIANS AND THEIR EGGS.[2]—In the preparation of Planarians for histological study, Mr. Iijima recommends corrosive sublimate as the only good preservative agent. The worms are placed in a shallow plate, *without water*, and a saturated solution of corrosive sublimate, heated almost to boiling, is poured over them. In this way they are killed so quickly that they do not have time to contract. They are left thirty minutes or less in the sublimate; then placed in water for an hour or more. The water should be changed several times, in order to remove all of the sublimate; otherwise it forms needle-like crystals, which impair or ruin the preparation. Three

[1] Edited by Dr. C. O. WHITMAN, Mus. Comparative Zoology, Cambridge, Mass.

[2] "Entwicklungsgeschichte der Süsswasser-Dendrocœlen." Zeitschr. f. wiss. Zoölogie, XL, p. 359, 1884.

grades of alcohol (" weak, strong, and absolute ") are used in hardening, in each of which the object should be left at least forty-eight hours before staining. Borax-carmine (probably the alcoholic solution) is recommended as a staining agent; a dilute solution is used in preference to the full strength, and allowed to act from three to four days.

For preservation as museum specimens, they are killed with strong nitric acid (about fifty per cent), in which they die fully extended.

Preparation of the Ova.—The egg-capsules of fresh-water Planarians are generally attached to water-plants by means of a white secretion. The ova are very small and few in number, and are scattered among an immense number of yolk-cells. The ova are completely naked, and a little smaller than the yolk-cells, and are not easily isolated. When cleavage begins, a large number of yolk-cells surround the ovum, and form with it a mass large enough to be seen with the naked eye. Mr. Iijima adopts the following mode of isolation and preparation: By the aid of two sharp dissecting needles, the egg-capsule is opened on an object-slide in dilute acetic acid (two per cent). The contents flow out, and the empty capsule is then removed. The slide is next shaken in order to isolate the ova so far as possible from the yolk-cells. This process detaches many of the yolk-cells, but not all; each ovum will still have yolk-cells adhering to it, and will now appear to the naked eye as a minute white mass. A cover-glass supported by wax feet, or by slips of paper is now placed over them. After about thirty minutes the acetic acid is carefully removed by the aid of small pieces of blotting paper placed at one side of the cover, and replaced by alcohol (seventy per cent). The withdrawal of the acetic acid must be as slow as possible, otherwise the ova will be lost. After an hour the alcohol is replaced by a stronger grade (ninety per cent), in which the ova should remain two hours. Finally, the alcohol is replaced by a mixture of glycerine and water in equal parts, and this in turn by pure glycerine. The preparation is now complete, and the cover-glass may be fixed in the usual way by means of lac.

In order to obtain sections of embryos which are too small to be treated individually, the contents of the capsule may be hardened in toto in chromic acid (one per cent), which renders them less brittle than corrosive sublimate.

The changes which take place in the ovum initiatory to cleavage are very difficult to trace, as they are generally completed before the cocoon is laid. In some cases ova were found in fresh-laid capsules, which showed the germinal vesicle still unchanged; others were found to have two nuclei, supposed to be derivatives from the first cleavage-nucleus. This stage of two nuclei was also found in some cocoons taken directly from the penial sheath, in which the cocoon formation takes place. It is therefore not quite certain when fecundation takes place, whether in the cocoon or before its formation.

THE CONNECTIVE SUBSTANCE IN THE HIRUDINEA.—The anatomy of the Hirudinea has been treated monographically by Mr. Bourne. The following remarks on the connective substance are taken from his paper.[1]

The amount of this tissue which is developed is in direct proportion to the "limpness" of the leech. Clepsine and Nephelis have very little of this tissue, and are consequently relatively firm and rigid to the touch while living. Hæmopis and Aulostoma present the other extreme, remaining flabby or "limp" in all states of muscular contraction; while Hirudo, Trocheta, and Pontobdella present an intermediate condition.

The connective substance consists of a hyaline, jelly-like mass, interspersed with cells. The intercellular matrix is probably developed by ectoplastic modification of the cells lying in it. The cells themselves undergo various modifications which take place simultaneously, and to a certain extent overlap one another. Four principal lines of modification are mentioned.

1. *Entoplastic metamorphosis.*—Vacuolated cells and fat cells. Vacuolation is brought about by the formation of droplets of a semi-fluid substance, which give the cell a reticulate appearance, resembling mammalian areolar tissue. Fat accumulates in certain cells in small globules, which may remain separate or run together, and form a large globule. The fat-cells do not occur in the Gnathobdellidæ.

2. *Ectoplastic metamorphosis.*—Elongated or branched connective tissue cells occur in all the Hirudinea. It is the processes of these cells that form the fibers which run in all directions through the connective matrix.

3. *Ect-entoplastic metamorphosis.*—The cells develop pigment. In Pontobdella, Clepsine, Piscicola, and Branchellion these cells take no part in forming a vascular system, as they do in the medicinal leech, and closely allied genera. The development of the vascularized cells (botryoidal tissue, vaso-fibrous tissue), may be studied to advantage in Aulostoma. "In the connective tissue in the central region of the body there are numerous rounded corpuscles which appear to be, on the one hand, elongating, forming branched corpuscles, and on the other, to be developing pigment, arranging themselves in rows. A metamorphosis of a portion of their substance forms channels, which afterwards come into communication with other similar channels, and with the closed vascular system on the one hand, and with the sinus system on the other, forming 'botryoidal tissue.'"

The nephridial funnels in Nephelis and Trocheta are lodged in vascular dilatations of the botryoidal tissue. The "cutaneous network" of the vascular system in Hirudo is formed from the same tissue.

In regard to the "vaso-fibrous" tissue, Mr. Bourne says, "I

[1] A. G. Bourne. Contributions to the Anatomy of the Hirudinea. Quart. Journ. Mic. Sci., XXIV, July, 1884, pp. 440.

would suggest, interpreting my own and Professor Lankester's observations, that capillaries of the botryoidal tissue become converted into capillaries of the 'vaso-fibrous' tissue."

The capillaries upon the gastro-ileal portion of the alimentary canal are not derived from botryoidal tissue, but are probably formed by vacuolation of primitive connective-tissue cells.

Cœlomic aud Vascular Spaces.—The contractile vacuoles of Protozoa, the ducts in nephridial cells, the newly developed vertebrate capillary, and all such intracellular spaces, are formed by metamorphosis of the cells themselves, and are thus distinct from cœlomic spaces. The formation of intracellular spaces may be distinguished as "*endocytic cœlosis*;" and the formation of intercellular spaces as "*paracytic cœlosis.*"

Sensory Cells.—Mr. Bourne has traced the connection of the nerve with elongated cells, the bodies of which lie beneath the epidermal layer. He has overlooked the existence of certain peculiar cells, which are probably sensory, as I have shown elsewhere. These sensory cells lie completely beneath the epidermis, and are precisely like those found in the eye.

Mr. Bourne regards the small papillæ, which have a regular segmental arrangement in the leech, as tactile organs, and in this agrees with Leydig. In speaking of the eyes as "derivatives" of these papillæ, Mr. Bourne might have given me credit for calling his attention to this point.—*C. O. W.*

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SCIENTIFIC NEWS.

— On Tuesday last, the 2d inst., a meeting was held in the lecture room of the Zoölogical Department, British Museum, at which Dr. Coues was invited to attend, in order to explain his views and those of his compatriots on the question of nomenclature.

The chair was taken by Professor Flower, F.R.S., and amongst the speakers were the following, in the order named: Mr. R. B. Sharpe, who opened the proceedings by reading a paper "On the expediency or otherwise, of adopting a trinomial nomenclature in zoölogy;" Mr. Seebohm, who read a second paper on the subject; Dr. Elliott Coues, who explained the system advocated, and its application as proposed by him; Dr. Günther, F.R.S., who approved the scheme conditionally; Mr. P. L. Sclater, F.R.S., who pointed out that the method was not a new one, but thought it deserving of adoption by zoölogists, provided the limits of its application were properly defined; Mr. Blanford, F.R.S.; Professor F. J. Bell; Mr. Kirby; Lord Walsingham; Dr. Sharp; Dr. Woodward, F.R S.; Mr. H. T. Wharton; Mr. Howard Saunders; Mr. J. E. Harting, and Dr. Traquair, F.R.S.

Various difficulties in the way of adopting a trinomial nomenclature were pointed out by different speakers; but, on the whole, the majority appeared inclined to a favorable consideration of the